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CONSULTING ENGINEERS

Mechanical
Electrical
Plumbing
Lighting
Technology

HIGHLAND ELEMENTARY SCHOOL ADMIN OFFICE REMODEL

MEPT SYSTEMS NARRATIVE

Owner Project Requirements

August 5th, 2022

| | |
|---------------------|---------------------|
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CONTENTS

| | |
|--|---|
| Codes and Standards | 1 |
| Building Description | 2 |
| Project Delivery Method | 2 |
| Mechanical HVAC Systems..... | 2 |
| General Provisions | 2 |
| Basic Materials and Methods..... | 2 |
| Revisions to the Existing HVAC System..... | 2 |
| Controls and Instrumentation | 3 |
| Startup | 3 |
| Plumbing systems | 3 |
| General Provisions | 3 |
| Fire Protection System..... | 3 |
| General Provisions | 3 |
| Electrical Systems..... | 4 |
| General Provisions | 4 |
| Basic Materials and Methods..... | 4 |
| Lighting..... | 5 |
| Communication Systems..... | 6 |
| TELECOMMUNICATIONS INFRASTRUCTURE..... | 6 |
| FIRE ALARM SYSTEM | 7 |
| Startup | 7 |

CODES AND STANDARDS

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|------------------|--|
| Building Code | 2019 Oregon Structural Specialty Code (OSSC) |
| Residential Code | 2021 Oregon Residential Specialty Code (ORSC) |
| Electrical Code | 2021 Oregon Electrical Specialty Code (OESC) |
| Mechanical Code | 2019 Oregon Mechanical Specialty Code (OMSC) |
| Energy Code | 2021 Oregon Energy Efficiency Specialty Code (OEESC) |
| Plumbing Code | 2021 Oregon Plumbing Specialty Code (OPSC) |

BUILDING DESCRIPTION

This project consists of the complete interior renovation of the Highland Elementary School administrative front office.

PROJECT DELIVERY METHOD

These documents are intended for use as the basis for subcontractor bidding. The system solutions included in these scope of work documents indicate the minimum performance requirements of the contractor's design. They are not to be construed as complete construction documents. The awarded contractor will be responsible for all final coordinated construction documentation, forms, and fees required for permitting and construction.

Upon completion of the project, the contractor shall provide record drawings and operations & maintenance (O&M) manual documentation for all systems and components installed under this scope of work. Documents reflecting the final installed conditions shall be provided by the contractor within 30 days following substantial completion of the project.

The contractor shall provide a warranty for the complete scope of construction and provide written documentation of this warranty to the owner. The duration of the warranty shall be not less than 1 year from the date of substantial completion.

MECHANICAL HVAC SYSTEMS

General Provisions

All applicable state and local mechanical, plumbing and energy codes will be followed.

Revisions will be made to the existing HVAC system to provide means for heating, ventilation and air conditioning to the reconfigured spaces. The existing air handling unit will remain and will provide the required heating, cooling, and ventilation. The existing variable volume terminal units will also remain, and modulate the airflow to the reconfigured spaces based on local thermostats. The existing controls will be reused.

Basic Materials and Methods

The existing conditions will serve as a precedent. Newly installed ductwork shall be concealed, spiral ductwork, and shall be insulated per OEESC. New ceiling diffusers and grilles will be surface mount.

Revisions to the Existing HVAC System

To meet the HVAC needs of the revised spaces, some slight modifications to the existing HVAC system are required. Based on site observations, the existing system components appear in good condition and are fit for reuse. The use of the general space is not expected to change significantly, and thus no additional heating or cooling capacity will be needed. To provide the elementary school

with new space that is cohesive, it is proposed that all ceiling diffusers and grilles are replaced. Existing diffusers and distribution ductwork downstream of the variable volume terminal units will be removed and replaced. Each of the three offices will be provided with a supply diffuser and return grille, while the vestibule, main office, and corridor will be provided with supply diffusers only. Each branch duct to the new diffusers and grilles will be provided with manual balancing dampers to balance the system at the revised airflows as indicated in the accompanying sketch.

Controls and Instrumentation

No changes to the existing controls system or logic is anticipated to be required. The existing variable volume terminal units modulate based on thermostats located within the space. It is proposed that the existing thermostats are temporarily removed and reinstalled according to the accompanying sketch.

Startup

The installing contractor shall be fully responsible for the start-up, checkout, and satisfactory operation of the equipment and systems installed. Testing and balancing of all ducted systems including ventilation air systems and common area heat pump duct systems is required at the completion of the project.

Testing and balancing shall be provided by an independent testing and balancing agency as required for the heating, ventilating, and air conditioning system. All test results shall be recorded in the booklet and submitted for approval; any and all deficiencies will be corrected by the TAB Contractor.

PLUMBING SYSTEMS

General Provisions

The plumbing scope in this space is minimal. The existing sink in the office shall be removed as indicated on the sketch. It is still to be determined if a replacement sink is desired. If no new sink is installed, the associated piping shall be removed. Based on the latest code interpretations, dead legs shall be no longer than 1.5 times the diameter of the pipe to reduce the amount of stagnant water and minimize the risk of legionella.

Fire Protection System

General Provisions

The existing sprinkler heads shall be removed and replaced in kind to meet the most recent code requirements. Slight reconfiguration of the fire protection piping is expected based on the revised room dimensions, particularly the newly enclosed office and vestibule.

ELECTRICAL SYSTEMS

General Provisions

Refer to attached drawings for additional information.

Applicable Codes will be followed for all new construction.

Shop drawings will be required prior to ordering of materials. Record drawings and operation and maintenance manuals will be required upon project completion.

Scope of Work in General:

- New branch circuits from existing panelboard: 120/208 volts, 3-phase, 4-wire, 60 Hz.
- Electrical grounding
- LED indoor lighting with luminaires rated for 120 volts
- Lighting controls
- Electrical connections and disconnecting means for mechanical and plumbing equipment, as required
- Electrical provisions for communications and life safety systems
- Modifications to the existing addressable horn/strobe fire alarm system
- Voice and data cabling system

Basic Materials and Methods

All materials, devices, etc., shall bear the UL label, or be UL listed as applicable except those specified items not covered by existing UL Standards.

NEC Type THW, THWN, or THHN, 600V thermoplastic covered solid copper wire except as otherwise noted shall be used. Other types as noted or used with permission shall be in compliance with applicable NEC and UL listing conditions. Wires sized as required by Code for current protective device rating, except no wire smaller than 12 AWG may be used in lighting and power circuits.

Wires 8 AWG and larger shall be stranded type conductors. Stranded conductors shall be used for control wiring and for special system wiring as specified. Stranded conductors shall not be terminated directly under binding screw type terminals. Compression lugs of proper pattern and size shall be used.

Conductors that extend into fixture housings, motor terminal boxes, and similar locations shall be of a type that is Code approved for the temperature and other conditions at the location.

Color coded wires shall be used for phase identification per NEC Section 210-5 with white neutrals of same size as phase wires and green ground wires sized per NEC Sections 250-94 and 250-95. Colored bands of tape shall be on exposed ends of conductor insulation to code feeders.

Splices shall be thoroughly cleaned, made mechanically and electrically secure, and finished with UL listed pressure connectors with insulating caps. All plastic or ceramic wire nuts will not be approved. Split bolt connectors and tape shall be used for larger wires.

All wiring in exposed or accessible locations shall be installed in electrically continuous conduit systems with conduits sized for feeders and branch circuits as required by NEC or local ordinance. All wiring in concealed locations of non-fire resistive construction shall be non-metallic sheathed typed cabling. This will be mainly located in the living units but will be extended to other portions of the building as allowed.

Where run, conduits shall be galvanized steel, EMT for general use, intermediate weight or rigid for locations required by Code. Exposed conduits are not permissible except where located within mechanical and electrical equipment rooms. Conduits laid in or on earth and in structural concrete shall be rigid or intermediate with threaded couplings and connectors. Connectors and couplings shall be all malleable iron or steel. Die cast is not an acceptable material. Watertight compression type or set screw type connectors and couplings for EMT shall be utilized for effective ground fault return path.

Flexible tubing, AC or MC cable for leads and taps shall be used as necessary. Flexible tubing or cable shall be used for connections to equipment that is subject to vibration or may require movement for adjustment. In no case shall flexible cable or tubing exceed 6'-0" in length.

Conduits shall be installed in practical alignment with the structure, with uniform pitch draining toward boxes, properly formed bends, and supported by means of clevises, clips, straps, etc., manufactured for the purpose and secured to the building in an approved manner.

Permanent identification shall be provided for electrical equipment and devices. Plates shall be aluminum, brass, or heavy plastic with engraved or embossed letters at least 1/4" high and shall be riveted or screwed in place.

Lighting

LED light fixtures will be used throughout the remodel area. Lighting levels for this project will meet current Illuminating Engineering Society (IES) recommended lighting levels. Refer to Architectural documents for luminaire types, quantities, and locations.

Occupancy sensors will be used in areas as required by Energy Code, such as offices, restrooms, corridors, storage closets, and the like. Override ability will be provided with local wall switches in secured locations. Where applicable, dual-level switching or dimming will be used to reduce energy use. Automatic daylighting control will be provided in areas with adequate fenestration and exposure to natural light.

LED lighting shall be provided throughout the remodel area. Interior luminaires shall have an efficacy not less than 100 lm/W. Exterior luminaires shall have an efficacy of not less than 100 lm/W.

Emergency lighting will be provided where required to achieve Code-minimum egress illumination via luminaires with integral UL-924 listed emergency backup batteries.

Lighting controls will be provided in general as follows:

| Space | Controls |
|---------------------------|---|
| Offices, Reception, Lobby | Manual on/off wall control Dimming Occupancy sensors |
| Circulation Spaces – Hall | Occupancy sensors Manual on/off override by wall switches in secured locations |
| Small Storage/Restrooms | Automatic on/off control of local lighting and exhaust fan by wall switch with integral occupant sensor |

COMMUNICATION SYSTEMS

TELECOMMUNICATIONS INFRASTRUCTURE

Applicable codes will be followed.

The existing phone and internet service infrastructure located in the demolition area will be removed and relocated by the service provider (Douglas Fast Net). Coordinate work with the owner.

The existing main telecommunications closet, located in Room 113, serves as the main cross connect and building distribution point. New infrastructure will be provided to the renovated areas of the project. Infrastructure will include copper distribution. Cabling buildout shall include modular copper patch panel(s), cable management, pathways, and boxes.

The new copper distribution system will consist of:

Horizontal Infrastructure – Category 6 (Data and Voice)

- Existing infrastructure is currently Category 5e. All new cabling shall be minimum Category 6.
- Includes associated termination hardware and components routed to both wall and ceiling locations to support connectivity requirements.
- Cabling shall be performed by a certified contractor that can provide a 25-year warranty on the cabling infrastructure. All new data cabling runs shall be tested with results provided during the closeout process.

Pathways and Boxes

- Includes recessed boxes, conduit pathways routed in wall to above accessible ceiling, insulating bushings at conduit stub-outs.

Identification

- Confirm final formatting requirements with the owner
- Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.

- Identify conductors, cables, and terminals in enclosures and at junctions, terminals, pull points, and locations with high visibility. Identify by system and circuit designation.
- Faceplates: Label individual faceplates with self-adhesive labels. Place label at top of faceplate.
 - Each faceplate shall be labeled with its individual, sequential designation, composed of the following, in the order listed:
 - Wiring closet and patch panel designation
 - Dash
 - Work area outlet number
- Equipment Room Labeling:
 - Patch Panels: Label individual rows in each rack, starting at top and working down, with self-adhesive labels
 - Data Outlets: Label each outlet with a self-adhesive label using the same scheme defined under faceplates
- Horizontal Cables: Label both ends of each cable with a polyester self-adhesive wraparound label indicating the following, in the order listed:
 - Room number
 - Colon
 - Faceplate number

The copper distribution system will be suitable for operating Ethernet equipment with 1000 Mbps data rate. The contractor will provide complete Fluke DSX (or equal/better equipment) test results to illustrate Category cable classification compliance.

FIRE ALARM SYSTEM

The existing fire alarm system will be extended to meet the needs of the remodel area.

The new system components will include horn/strobe notification appliances, smoke detectors as required, conduit and wire.

The building will be partially sprinkled. Detection shall be placed in all appropriate locations.

Installation of the system and its component devices will be in accordance with the manufacturer's detailed instructions with respect to mounting of devices, electrical connections, circuit loading, and power supply.

Installation will be in accordance with OSSC 2019 NFPA 72, NEC 760, and all circuits marked in accordance with NEC 760-23. Installation and locations of signaling devices will comply with ADA requirements.

The fire detection and alarm system will be tested and certification will be filed with the Architect/Engineer before acceptance.

STARTUP

The installing contractor is fully responsible for the start-up, checkout, and satisfactory operation of the equipment and systems installed.